Mobile Broadband Performance Report Charts and Data Products

Re-identification Review Planning

The Measuring Broadband America Program's mobile measurement effort will provide consumers and other interested stakeholders valuable information about the state of mobile broadband performance in the US. Based on past experience reporting of consumer fixed broadband performance, a report on mobile broadband performance might include diverse Charts and Maps describing different aspects of performance. A goal of the program is to release together with reports the data that support these visualizations in a manner that would not compromise subscriber volunteers' anonymity. Some descriptions of broadband performance might include:

- Maps Showing

    1. Deadzones by Carrier and Bearer
    2. Location of Cell Towers
    3. On-Peak Download Speed Active Test Results by Carrier, Bearer, Geographic Block
    4. Off-Peak Download Speed Active Test Results by Carrier, Bearer, Geographic Block
    5. On-Peak Upload Speed Active Test Results by Carrier, Bearer, Geographic Block
    6. Off-Peak Upload Speed Active Test Results by Carrier, Bearer, Geographic Block
    7. On-Peak Latency Active Test Results by, Bearer, Geographic Block
    8. Off-Peak Latency Active Test Results by, Bearer, Geographic Block
    9. On-Peak Packet Loss Active Test Results by Carrier, Bearer, Geographic Block
    10. Off-Peak Packet Loss Speed Active Test Results by Carrier, Bearer, Geographic Block
    11. On-Peak Coverage Map showing Carrier, Bearer Channel, Average Signal Strength, Geographic Block
    12. Off-Peak Coverage Map showing Carrier, Bearer Channel, Average Signal Strength, Geographic Block

- Charts Showing

1. On-Peak Download Speed Active Test Results by Carrier, Bearer, Top 50 Metro Locations
2. Off-Peak Download Speed Active Test Results by Carrier, Bearer, Top 50 Metro Locations
3. On-Peak Upload Speed Active Test Results by Carrier, Bearer, Top 50 Metro Locations
4. Off-Peak Upload Speed Active Test Results by Carrier, Bearer, Top 50 Metro Locations
5. On-Peak Latency Active Test Results by, Bearer, Top 50 Metro Locations
6. Off-Peak Latency Active Test Results by, Bearer, Top 50 Metro Locations
7. On-Peak Packet Loss Active Test Results by Carrier, Bearer, Top 50 Metro Locations
8. Off-Peak Packet Loss Speed Active Test Results by Carrier, Bearer, Top 50 Metro Locations
9. Percent Coverage of 4G in Top 100 Metros by Carrier

10. Upload Speed Active Test Results for WiFi (reported as per cellular rates: peak/non-peak, by geoblock)
11. Download Speed Active Test Results for WiFi (see above)
12. Latency Active Test Results for WiFi (see above)
13. Packet Loss Active Test Results for WiFi (see above)

Possible Supporting Public Data Products and Analysis

1. Dead Zone Database (Public)

Public Release Row level data: {latitude, longitude, Carrier, Bearer, Peak/Off-Peak} {subject to aggregation by geographic block)
Source Private Row level data: {latitude, longitude, Carrier, Bearer, Timestamp}

Review:
1. Concerns with high-precision position and time information;
2. Possible quasi-identifiers may be drawn from carrier and bearer channel.

2. Cell Tower Location Database (Public)

Public Release Row level data: {latitude, longitude, Cell Tower ID, Carrier, Bearer}
Source Private Row level data: {latitude, longitude, Cell Tower ID, Received Signal Strength, Carrier, Bearer, Timestamp}

Review:
1. Review possible concerns with quasi-identifiers drawn from carrier and bearer channel;
2. Review level of precision for locations for Cell tower ID and implications for including cell tower ID with other row-level data.

3. Active Test Results with Carrier, Bearer, Location, and Peak/Off-Peak Time Info

Public Release Row level data:
1. Download | Upload | Latency | Packet Loss Active Test Metric;
2. Carrier;
3. Bearer;
4. Coarse Location;
5. Peak/Off-Peak or Coarse Time

Source Private Row-level Data
1. Latitude, longitude;
2. Cell Tower ID;
3. Received Signal Strength;
4. Carrier;
5. Bearer;
6. Timestamp

Review:

1. Analyze benefits of coarsening high-precision timestamp to Peak/Off-Peak or other less granular measure to addressing risks of re-identification using time as quasi-identifier;
2. Demonstrate how the number of subscribers and the number of measurements gathered in the coarse location influence the level of anonymity and re-identification risk at various levels of geospatial detail
3. Identify how coarsened time and location context influence the statistical likelihoods of possible matching with quasi-identifiers drawn from carrier and bearer channel
4. Identify how deletion of some data might impact level of anonymity and re-identification risk